

WHAT IS CLAIMED IS:

- 1 1. A display device, comprising:
2 a base member adapted to receive at least one light device;
3 a conductive layer provided on the base member and configured
4 to electrically interconnect with the light device; and
5 a light guide member integrally formed on one or more of the
6 base member and conductive layer, and having at least one aperture
7 configured to at least partially surround the light device.
- 1 2. The display device of Claim 1 wherein the base member
2 includes at least one opening configured to receive a material used in the
3 formation of the light guide member.
- 1 3. The display device of Claim 2 wherein the opening is a plurality
2 of cylindrical openings disposed adjacent the light source.
- 1 4. The display device of Claim 2 wherein the conductive layer
2 extends at least partially through the opening.
- 1 5. The display device of Claim 2 wherein the light guide member is
2 molded in a securing relationship with the opening.
- 1 6. The display device of Claim 1 wherein at least one conductive
2 pad is provided on an underside of the base member and configured to
3 provide electrical connectivity with the light device.
- 1 7. The display device of Claim 1 wherein the conductive layer
2 provides a circuit.
- 1 8. The display device of Claim 7 wherein the circuit includes a
2 cathode and at least one anode for connecting the light device.

1 9. The display device of Claim 8 wherein the light device is
2 substantially centered within the aperture.

1 10. The display device of Claim 1 wherein the aperture is defined by
2 side walls having a truncated cone shape.

1 11. The display device of Claim 1 wherein the light device is a single
2 color LED.

1 12. The display device of Claim 1 wherein the light device is a
2 multicolor LED.

1 13. The display device of Claim 1 further comprising a contrasting
2 coating provided on the light guide member.

1 14. The display device of Claim 1 further comprising an optical
2 coating.

1 15. The display device of Claim 1 wherein the light device is
2 encapsulated within the aperture by a fill material.

1 16. The display device of Claim 1 wherein the display assembly is a
2 one of a sign, a display panel and a message board.

1 17. The display device of Claim 1, wherein the display assembly is
2 adapted to provide a message in a first language and a second language.

1 18. The display device of Claim 1, wherein the display assembly is a
2 retrofit display assembly adapted to replace an existing display.

1 19. The display device of Claim 1, wherein the display assembly is a
2 taxiway sign.

1 20. A method of making a display device, the method comprising:
2 providing a base member having a conductive layer provided in
3 a pattern thereon;
4 forming a light guide member having at least one aperture onto
5 at least one of the base member and the conductive layer; and
6 attaching at least one LED to the conductive layer so that the
7 LED is disposed within the aperture.

1 21. The method of Claim 20 further comprising the step of applying
2 a contrasting coating on the light guide member.

1 22. The method of Claim 20 further comprising the step of applying
2 an optical coating on the light guide member.

1 23. The method of Claim 20 further comprising the step of filling the
2 aperture with a fill material.

1 24. The method of Claim 23, further comprising the step of curing
2 the fill material.

1 25. The method of Claim 20 further comprising the step of
2 separating the base member, the conductive layer and the light guide member
3 into a plurality of pixels.

1 26. The method of Claim 25 wherein the step of separating
2 comprises use of a dicing saw.

1 27. The method of Claim 25 further comprising the step of
2 evaluating the pixels in accordance with at least one performance criteria.

1 28. The method of Claim 27 further comprising the step of
2 segregating the pixels according to the performance criteria into at least one
3 graded category of the pixels having performance characteristics
4 representative of the performance criteria.

1 29. The method of Claim 28 further comprising the step of
2 assembling the pixels from the graded category into a display assembly.

1 30. The method of Claim 20 wherein the base member includes at
2 least one opening and the step of forming a light guide includes forming a light
3 guide material in communication with the opening.

1 31. A display device made according to the method of Claim 20.

1 32. A molded light guide for a flat panel display device having a
2 base member with at least one light source, the molded light guide comprising
3 a layer of material integrally disposed on the base member and having at
4 least one aperture defining a lighting profile with the light source.

1 33. The molded light guide of Claim 32 wherein the base member
2 includes at least one opening configured to receive a portion of the layer of
3 material.

1 34. The molded light guide of Claim 32 wherein the lighting profile is
2 a truncated cone shape.

1 35. The molded light guide of Claim 32 wherein the lighting profile is
2 a parabolic shape.

1 36. The molded light guide of Claim 32 further comprising a
2 conductive material provided in one or more traces on the base member to
3 provide a circuit configured for electrical interconnection with the light source.

1 37. The molded light guide of Claim 36 wherein the base member
2 and the conductive material are configured to form a circuit board.

1 38. The molded light guide of Claim 32 wherein the light source is
2 an LED.

1 39. The molded light guide of Claim 38 wherein the LED is a
2 multicolor LED.

1 40. The molded light guide of Claim 38 wherein the LED is a
2 monochromatic LED.

1 41. The molded light guide of Claim 32 further comprising a fill
2 material disposed within the aperture.

1 42. The molded light guide of Claim 32 wherein the base member,
2 the layer of material and the light sources are configured for separation into a
3 plurality of pixels.

1 43. The molded light guide of Claim 42 wherein the plurality of pixels
2 are configured for separation by a dicing saw.

1 44. The molded light guide of Claim 43 wherein the pixels are
2 evaluated to establish a grade according to a set of performance
3 characteristics.

1 45. The molded light guide of Claim 44 wherein the pixels are
2 grouped into one or more groups according to the grade.

1 46. The molded light guide of Claim 45 wherein the pixels from one
2 of the one or more groups are assembled into one or more display blocks of
3 the pixels.

1 47. The molded light guide of Claim 46 wherein the one or more
2 display blocks of the pixels are assembled into a display assembly.

1 48. The molded light guide of Claim 47 wherein the display
2 assembly is one of a sign, a message board and an information display.

1 49. The molded light guide of Claim 47 wherein the display
2 assembly is a retrofit display assembly.

1 50. A display assembly comprising:
2 means for providing a base member made from an insulating
3 material;
4 means for providing at least one light source coupled to the
5 base member;
6 means for integrally forming a light guide member on the base
7 member; and
8 means for providing an electrical connection to the light source.

1 51. The display assembly of Claim 50 further comprising means for
2 providing a light emission profile on the light guide member.

1 52. The display assembly of Claim 50 further comprising means for
2 providing a contrasting coating on the light guide member.

1 53. The display assembly of Claim 50 further comprising means for
2 providing an optical coating on the light guide.

1 54. The display assembly of Claim 50 further comprising means for
2 providing one or more pixels.

1 55. The molded light guide of Claim 54 further comprising means for
2 assembling the one or more pixels into a graded pixel block adapted for use in
3 a light emitting display panel.

1 56. A signal device, comprising:
2 a base member;
3 a plurality of light sources coupled to the base member;
4 a circuit formed on the base member and electrically
5 interconnected with the plurality of light sources;
6 a light guide integrally formed on the base member and having a
7 plurality of apertures at least partially surrounding the plurality of light sources;
8 so that the light source is configured to provide a signal.

1 57. The signal device of Claim 56 wherein the plurality of light
2 sources is a plurality of LEDs.

1 58. The signal device of Claim 57 wherein at least one portion of the
2 plurality of LEDs are multicolored LEDs.

1 59. The signal device of Claim 57 wherein at least a portion of the
2 plurality of LEDs are monochromatic LEDs.

1 60. The signal device of Claim 56 wherein the signal is a first signal
2 configured to indicate a first function and a second signal configured to
3 indicate a second function.

1 61. The signal device of Claim 60 wherein the first function and the
2 second function are indicated simultaneously.

1 62. The signal system of Claim 56 wherein the light guide is a
2 substantially planar member.

1 63. The signal system of Claim 56 further comprising a lens member
2 coupled in substantially facing engagement with the light guide.

1 64. A signaling system, comprising:
2 a base member adapted for installation on a vehicle;
3 a plurality of LEDs coupled to the base member;
4 a circuit disposed on the base member and interconnected with
5 the LEDs;
6 a light guide member formed on the base member and having a
7 plurality of light emission profiles communicating with the plurality of LEDs to
8 provide a signal.

1 65. The signaling system of Claim 64 wherein the base member and
2 the circuit are configured to provide a printed circuit board.

1 66. The signaling system of Claim 64 wherein the light guide
2 member is substantially planar and is molded onto the base member in
3 substantially facing engagement.

1 67. The signaling system of Claim 64 wherein the plurality of LEDs
2 include at least one multicolored LED.

1 68. The signaling system of Claim 64 wherein the plurality of LEDs
2 include at least one monochromatic LED.

1 69. The signaling system of Claim 64 further comprising a lens
2 member coupled to the light guide member.

1 70. The signaling system of Claim 64 wherein the signal indicates a
2 function related to operation of the vehicle.

1 71. The signaling system of Claim 64 wherein the signal
2 simultaneously indicates two or more functions related to operation of the
3 vehicle.

1 72. The signaling system of Claim 64 wherein the base member is
2 adapted to couple to an outer panel member of the vehicle.

1 73. An optical coupling device, comprising:
2 a first coupling portion including a first base member having at
3 least one light transmitting device provided thereon, and a first light guide
4 member integrally formed on the first base member and having at least one
5 aperture configured to at least partially surround the light transmitting device;
6 and
7 a second coupling portion second base member having at least
8 one light receiving device provided thereon, and a second light guide member
9 integrally formed on the second base member and having at least one
10 aperture configured to at least partially surround the light receiving device;
11 so that when the first coupling portion and the second coupling
12 portion are aligned in a substantially facing engagement, a signal may be
13 communicated between the light transmitting device and the light receiving
14 device.

1 74. The optical coupling device of Claim 73 further comprising a first
2 receptacle configured to attach to the first coupling portion and a second
3 receptacle configured to attach to the second coupling portion.

1 75. The optical coupling device of Claim 74 wherein the first
2 receptacle and the second receptacle are configured to be selectively
3 interlocked so that the light transmitting devices and the light receiving
4 devices are aligned in a predetermined pattern.

- 1 76. A pixel for use in a display assembly, comprising:
2 a base member made from an insulating material;
3 a conductive material applied in a predetermined pattern to the
4 base member to provide a circuit;
5 a light guide member having an opening and integrally formed
6 on at least one of the base member and the conductive material;
7 at least one light source disposed at least partially within the
8 aperture and coupled to the base member and operably interconnected to the
9 conductive material.
- 1 77. The pixel of Claim 76 wherein the aperture is filled with a potting
2 material.
- 1 78. The pixel of Claim 76 wherein the circuit further comprises a
2 cathode and at least one anode.
- 1 79. The pixel of Claim 78 wherein the light source is an LED
2 electrically interconnected to the anode and the cathode.
- 1 80. The pixel of Claim 76 wherein the pixel is graded according to
2 predetermined performance criteria and placed in a group according to the
3 grade.
- 1 81. The pixel of Claim 80 wherein the pixel is configured for use with
2 other pixels from the group for use in the formation of the display assembly.